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Report on the individual review of the annual submission of Australia submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of Australia, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 28 August to 2 September 2017.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

		Paragraphs	*Page*
	Abbreviations and acronyms		3
I.	Introduction	1–5	5
II.	Summary and general assessment of the 2017 annual submission	6	6
III.	Status of implementation of issues and/or problems raised in the previous review report	7	8
IV.	Issues identified in three successive reviews and not addressed by the Party	8	16
V.	Additional findings made during the 2017 individual inventory review	9–10	17
VI.	Application of adjustments	11	32
VII.	Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol	12–13	32
VIII.	Questions of implementation	14	32
Annexes			
I.	Overview of greenhouse gas emissions and removals for Australia for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Australia		33
II.	Information to be included in the compilation and accounting database		38
III.	Additional information to support findings in table 2		40
IV.	Documents and information used during the review		41

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
Bo	maximum theoretical methane producing capacity
CaO	calcium oxide
CEF-ne	newly established forest
CER	certified emission reduction
CH_4	methane
CM	cropland management
COD	chemical oxygen demand
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
FAO	Food and Agriculture Organization of the United Nations
F-gas	fluorinated gas
FM	forest management
FMRL	forest management reference level
$Frac_{LEACH-(H)}$	Fraction of N input to managed soils that is lost through leaching and run-off
FullCAM	full carbon accounting model
GHG	greenhouse gas
GM	grazing land management
HFCs	hydrofluorocarbons
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPPU	industrial processes and product use
KP-LULUCF activities	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MgO	magnesium oxide
N	nitrogen
NA	not applicable
NGER	National Greenhouse and Energy Reporting

NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SFo	scaling factor for organic amendments
SFp	scaling factors for water regimes before the cultivation period
SFw	scaling factor for water regimes during the cultivation period relative to continuously flooded fields
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
UN Comtrade	United Nations Commodity Trade Statistics Database
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
VS	volatile solids
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of Australia organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 28 August to 2 September 2017 and was coordinated by Ms. Claudia do Valle (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Australia.

Table 1
Composition of the expert review team that conducted the review of Australia

Area of expertise	*Name*	*Party*
Generalist	Mr. Michael Gitarskiy	Russian Federation
	Ms. Maria Jose Lopez	Belgium
Energy	Mr. Simon Eggleston	United Kingdom of Great Britain and Northern Ireland
	Mr. Shengmin Yu	China
IPPU	Mr. Domenico Gaudioso	Italy
	Ms. Sina Wartmann	Germany
Agriculture	Mr. Chris Dore	United Kingdom
	Ms. Rocio Danica Condor	Italy
LULUCF	Mr. Erik Karltun	Sweden
	Ms. Valentyna Slivinska	Ukraine
Waste	Mr. Ole-Kenneth Nielsen	Denmark
	Mr. Excellent Hachileka	Zambia
Lead reviewers	Mr. Gitarskiy	
	Mr. Yu	

2. The findings in this report are based on the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that Australia resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings and, if applicable, encouragements of the ERT to Australia to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Australia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

[1] At the time of publication of this report, Australia had submitted its instrument of ratification of the Doha Amendment, however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

4. Annex I shows annual GHG emissions for Australia, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Australia.

5. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the 2017 annual submission

6. In accordance with paragraph 76 of the UNFCCC review guidelines and paragraphs 47 and 65 of the Article 8 review guidelines, the ERT has prioritized: the review of issues and/or problems identified in previous review reports or in the initial assessment; recalculations in the latest submission that have changed the emissions or removals estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years; and supplementary information reported under the Kyoto Protocol. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the desk review. Further information on the issues identified, as well as additional findings, may be found in tables 3, 5 and 6.

Table 2
Summary of review results and general assessment of the inventory of Australia

Assessment			*Issue or problem ID[a](s) in table 3, 5 and or 6[a]*
Date of submission	Original submission: 27 May 2017 (NIR), 27 May 2017, Version 1 (CRF tables), 27 May 2017 (SEF-CP1-2016 and SEF-CP2-2016)		
Review format	Desk review		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	I.2, I.16, A.15, A.17, W.7
	(c) Development and selection of EFs	Yes	I.10, I.14, I.15, W.3, W.6
	(d) Collection and selection of AD	Yes	I.18
	(e) Reporting of recalculations	Yes	G.4, L.15, KL.10
	(f) Reporting of a consistent time series	Yes	I.7, L5, L.6
	(g) Reporting of uncertainties, including methodologies	Yes	G.7, G.8
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	L.7
	(j) Application of corrections to the inventory	No	

Assessment			*Issue or problem ID[a](s) in table 3, 5 and or 6[a]*
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	Yes	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	Yes	G.5
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	No	
	(c) Reporting requirements of decision 6/CMP.9	No	
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	Yes	KL.3
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	

Assessment			*Issue or problem ID[a](s) in table 3, 5 and or 6[a]*
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors that are not listed in this table but are included in table 3, 5 and/or 6 in this document.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III to this document.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 26 April 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Australia

ID[a]	*Issue and or problem classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Article 3, paragraph 14, of the Kyoto Protocol – (G.6, 2016) Transparency	Improve the transparency of the reporting on Article 3, paragraph 14, of the Kyoto Protocol and, in particular, provide information to confirm whether the changes reported in the submission are related to the actions listed in decision 15/CMP.1, annex, paragraph 24.	Resolved. In accordance with paragraph 24, annex to decision 15/CMP.1, Australia provided in the NIR (vol. 3, chapter 15) information on the following actions: (1) participation in the ad hoc technical expert group on the impact of the implementation of response measures during the UNFCCC sessions; (2) establishment of the Climate Technology Initiative Private Finance Advisory Network and of the Clean Energy Solutions Centre, both with the objective to facilitate clean energy financing and capacity-building; (3) participation in

[4] FCCC/ARR/2016/AUS.

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			bilateral initiatives to deploy low-carbon technologies and in multilateral funds, including the Green Climate Fund, the World Bank and the Asian Development Bank.
G.2	Recalculations – (G8, 2016) Transparency	Transparently report, in chapter 10 of the NIR, the reasons and associated quantitative impacts of the largest recalculations.	Resolved. The description of the recalculations, their reasons and associated quantitative impacts were explained in the NIR (vol. 2, chapter 10).
G.3	National registry – (G.9, 2016) Transparency	Update the publicly available 2015 reports to include the CER units in accordance with decision 13/CMP.1, annex, chapter II.E, in conjunction with decision 3/CMP.11, and minimize errors linked to the public report automatic population function.	Resolved. The automatic population function was redesigned and the publicly available 2015 reports were updated to include CER units in the web page of the Australian National Registry of Emissions Units (available at: https://nationalregistry.cleanenergyregulator.gov.au/report/listPublicReports). See the NIR (vol. 3, table A6.6(c), p.168).
Energy			
E.1	1.B.2 Oil and natural gas and other – liquid and solid fuels – CO_2 and CH_4 (E.8, 2016) (E.18, 2015) Accuracy	Make efforts to improve the data for the emissions from this category, including the development of updated EFs that represent production activities in unconventional gas production.	Resolved. Australia updated methods, AD and EFs for this category, including the implementation of the Australian-based EF for onshore coal seam gas wells. See the NIR (vol.1, section 3.9.2).
E.2	1.B.2.b Natural gas – natural gas – CO_2 and CH_4 (E.7, 2016) (E.17, 2015) Accuracy	Collect data on emissions from any new plant types, and update the country-specific CO_2 and CH_4 EFs, where appropriate (the previous ERT noted that a new liquefied natural gas plant had started operation).	Resolved. Australia updated methods, AD and EFs for this category, disaggregating emissions by different plant and gas type (including the new liquefied natural gas plant and the coal seam gas plant). See the NIR (vol. 1, section 3.9.2. p.136).
IPPU			
I.1	2. General (IPPU) – HFCs and SF_6 (I.2, 2016) (I.25, 2015) Transparency	When provisional data for AD are used or reported in the NIR (e.g. identical data to those reported for the previous year as was identified by the previous ERT for the year 2013), provide transparent information that the Party is doing so and the rationale for doing so (e.g. for 2.F.1 refrigeration and air conditioning and 2.G.1 electrical equipment).	Resolved. The AD for the consumption of HFCs and SF_6 (category 2.F) and the national stock of electrical equipment (category 2.G.1) were addressed in the 2016 submission. In the 2017 submission, Australia revised stock data for domestic refrigeration (category 2.F.1.2) and no provisional data are used (see NIR table 4.27, p.224). In addition the Party removed the footnote mentioned in the rationale by the previous ERT (see ID# I.2, 2016).
I.2	2.A.1 Cement production – CO_2 (I.4, 2016) (I.7, 2015) Accuracy	Confirm or update the CaO and MgO content ratios in order to ensure the accuracy of the values for more recent years and the consistency of the time series.	Addressing. Content ratios for CaO and MgO are still constant for the entire time series (1990–2015) and based on a 1992 study (see NIR section 4.3.1, p.177). Australia is investigating the availability and/or derivation of content ratios. The Party has not indicated when these updates will be implemented.

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
I.3	2.A.1 Cement production – CO_2 (I.32, 2016) Transparency	Provide explanatory information with regard to the fluctuation of emissions related to the clinker production trend in the NIR, including the information that domestic production has decreased due to competition with imported products, and that in 2012 a clinker production facility ceased operation.	Resolved. The Party included this information in the NIR (section 4.3.1, p.177), noting that clinker production in Australia is sensitive to market conditions and imports of clinker.
I.4	2.A.4 Other process uses of carbonates – CO_2 (I.33, 2016) Comparability	Report, in accordance with the 2006 IPCC Guidelines, the emissions from the use of carbonates in the category in which they are used, where possible, or justify the inclusion of the emissions under 2.A.4 other process uses of carbonates by explaining in the NIR that confidentiality reasons do not allow reporting the use of carbonates in the category in which they are used.	Resolved. The Party has provided information that justifies the inclusion of the emissions under 2.A.4 in order to comply with confidentiality requirements in the NIR (section 4.4.13 p.201).
I.5	2.B.1 Ammonia production – CO_2 (I.7, 2016) (I.10, 2015) Transparency	Improve the level of transparency used to report disaggregated subcategory emission data for ammonia production, while preserving the legally required confidentiality in the overall reporting of emissions.	Addressing. Australia explained that the possibility for further disaggregation of emission data for ammonia production is limited because of confidentiality requirements under the NGER system (see NIR section 4.4.13, p.201). The Party also explained that the confidential data can be provided to the ERT during the review. The ERT considers that, owing to the confidentiality restrictions of the NGER Act, it is not legally possible for the Party to provide disaggregated data on ammonia production. However, the ERT consider that providing AD in 100 base indexed on 1990, or presenting AD trends as graphics without any numbers, might be a suitable compromise that would improve the transparency of the report.
I.6	2.B.1 Ammonia production – CO_2 (I.8, 2016) (I.10, 2015) Transparency	Ensure consistency between the emission levels reported in the IPPU chapter of the NIR and in the key category analysis.	Not resolved. As described in the rationale in ID# I.5 above, disaggregation of emission data for ammonia production is very limited owing to confidentiality requirements under the NGER system. However, in the key category analysis (NIR vol. 3, annex 1, p.105) CO_2 emissions for ammonia production are estimated disaggregated for the base year (603 kt CO_2) and the current year (i.e. 2,606 kt CO_2 eq in 2015). The ERT noted that disaggregated data for ammonia production in the key category analysis have been provided since the 2015 submission and no explanation was provided by the Party on why it was possible to disaggregate in the key category analysis and not in the CRF table (see ID# I.5 above). During the review the Party informed the ERT that consistency will be

ID#	*Issue and/or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
			ensured and the key category analysis will adhere to the current requirements of the CRF table.
I.7	2.C Metal industry – CO_2 (I.11, 2016) (I.34, 2015) Consistency	Investigate whether other drivers could be applied to estimate emissions from lead production, zinc production and other (metal production) for the period 1990–2008, such as production volumes.	Addressing. In its NIR (section 4.5.5, p.209), Australia explained that AD for nickel and silver production from 1990–2008 were derived using metal production statistics from the Bureau of Resources and Energy Economics. However, for lead, zinc and other metals the Party explained that research on the availability of data to support pre-NGER (1990–2008) estimates will continue.
I.8	2.C.1 Iron and steel production – CH_4 (I.15, 2016) (I.17, 2015) Transparency	Correct the AD for steel production in the CRF tables and improve the QA/QC tests for the reporting in the NIR and the CRF tables in order to avoid data entry errors.	Not resolved. The data for steel production (kt) reported in NIR table 4.16 are not consistent with the data reported in CRF table 2(I)A-Hs2 for 2014 and 2015.
I.9	2.F. Product uses as substitutes for ozone-depleting substances – HFCs (I.22, 2016) (I.23, 2015) Transparency	Include in the methodological description in the NIR a more accurate description of the methodology used, in particular the use of the vintage stock model.	Addressing. Australia included in the 2016 submission additional text explaining the methodology for EFs, but no description or information on the vintage model. The Party explained that the vintage stock model is being currently assessed with a view to incorporating additional country-specific data and will include a description of the methodology when it is finalized.
I.10	2.F.5 Solvents – HFCs (I.28, 2016) (I.30, 2015) Accuracy	Align the calculation method with the definition provided in the NIR, and apply an operational loss of 25 per cent, 50 per cent and 25 per cent, respectively, for use of F-gases as solvents.	Not resolved. Australia informed the ERT that the recommendation will be implemented in the next submission. In the NIR (section 4.8.6, p.254) the Party also explained that an operational loss rate of 25 per cent, 50 per cent and 25 per cent, respectively, is to be applied to the vintage stock model for the use of F-gases as solvents.
I.11	2.G.3 N_2O from product uses – N_2O (I.34, 2016) Transparency	Include in the NIR the information that from 2003 onwards, one of the two N_2O producing plants in Australia ceased production and the Party started to import N_2O and that for 2003 onwards, N_2O emissions from product uses are estimated based on imports in addition to domestic production.	Addressing. The Party provided the required information in NIR section 4.4.2 (category 2.B.2 Nitric acid production, p.192). However, the ERT is of the view that the information should have been included in the section for the appropriate category, 2.G.3. In addition, during the review further clarification was provided by the Party that should also be included in the NIR (see follow-up in ID# I.18 in table 6).
Agriculture			
A.1	3. General (agriculture) – CH_4 and N_2O (A.4, 2016) Transparency	Include in the NIR an explanation of the approach and assumptions (e.g. average life cycle of animal categories that are alive for part of a year only) used to derive the average annual livestock population.	Resolved. Australia included the required information in NIR section 5.3.2.2. However, the ERT identified a further issue (see ID# A.14 in table 6).

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
A.2	3.A.2 Sheep – CH_4 (A.6, 2016) Transparency	Include in the NIR the explanatory information provided to the ERT during the review, that is, that the method for estimating the amount of feed consumed by sheep (NIR, equation 3A.2_1) takes full account of the feed energy requirements identified by the ERT such as wool production, grazing in large areas and growing rate.	Resolved. Australia has provided the required information in the NIR (vol. 1, section 5.3.3).
A.3	3.B.1 Cattle – CH_4 (A.9, 2016) Transparency	Include in the NIR the reference for the methane density value.	Resolved. Australia has provided the required information in the NIR (vol. 1, section 5.4.2.1).
A.4	3.B.1 Cattle – CH_4 (A.10, 2016) Transparency	Include the reference to the country-specific data for the ash content of manure in the NIR.	Resolved. Australia has provided information in the NIR (vol. 1, section 5.4.4).
A.5	3.B.1 Cattle – CH_4 (A.11, 2016) Transparency	Include information in the NIR on the justification of the use of the IPCC default B_o value for North America.	Resolved. Australia included the required information in NIR (vol. 1, section 5.4.4.1, p.282).
A.6	3.C Rice cultivation – CH_4 (A.12, 2016) Transparency	Include in the NIR the explanation of the water regime prior to the cultivation period (i.e. that after rice harvesting, Australian rice growers use the subsoil moisture remaining in the soil to plant either wheat or pasture for animals), with supporting references.	Resolved. Australia has provided information in the NIR (vol. 1, section 5.5.1).
A.7	3.D.a Direct N_2O emissions from managed soils – N_2O (A.14, 2016) Comparability	Report correct AD for N input from animal manure applied to soils, urine and dung deposited by grazing animals as well as N mineralization/immobilization associated with loss/gain of soil organic matter in CRF table 3.D.	Resolved. Correct AD were provided in CRF table 3.D for all subcategories.
A.8	3.D.b.2 Nitrogen leaching and run-off – N_2O (A.17, 2016) Comparability	Report the applied value 0.3 for $Frac_{LEACH-(H)}$ instead of the notation key "NA" in CRF table 3.D.	Resolved. A $Frac_{LEACH-(H)}$ of 0.30 is reported in CRF table 3.D.
LULUCF			
L.1	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.27, 2016) Transparency	Include in the NIR the descriptions, references and sources of information for the methodologies, assumptions, EFs and AD, as well as the rationale for the selection of wetlands converted to cropland, wetlands converted to grassland and settlements remaining settlements.	Resolved. The Party provided the information on the methodologies, assumptions, EFs and AD in the NIR, volume 2: in section 6.7.1.2 for wetlands converted to cropland; in section 6.9.1.2 for wetlands converted to grassland; and in section 6.12.1 for settlements remaining settlements.
L.2	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.28, 2016)	Explain in the NIR and CRF table 9 that emissions and removals from grassland converted to cropland are reported under cropland remaining	Resolved. The explanation regarding inclusion of emissions and removals from grassland converted to cropland under cropland remaining cropland has been

ID[a]	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	Transparency	cropland because annual variations in areas under cropping in Australian agricultural systems do not constitute a permanent land-use change.	provided by the Party in the NIR (vol. 2, section 6.6).
L.3	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.29, 2016) Comparability	Explain in the NIR and CRF table 9 under which categories the estimates for the following categories and pools are reported: cropland, wetlands and settlements converted to forest land (all pools except organic soils); cropland converted to grassland (all pools); and cropland and grassland converted to settlements (all pools).	Addressing. Australia provided in NIR table A.5.1 (vol. 3, p.141) information on where the categories reported as "IE" are included. However, the update of CRF table 9 is still missing.
L.4	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.29, 2016) Comparability	Provide separate AD and estimates for the following categories and pools currently reported as "IE": cropland, wetlands and settlements converted to forest land (all pools except organic soils); cropland converted to grassland (all pools); and cropland and grassland converted to settlements (all pools). Until this is done, the ERT recommends that Australia provide in its NIR an update of the status of its efforts to provide estimates for these pools.	Addressing. The Party reported in the NIR (vol. 2, section 6.3.2, p.19) that planned improvements are under way to develop a fully spatially explicit time series of land-use maps to apply approach 3 'land representation to all land uses", to enable reporting of separate AD and emissions estimates for all conversion categories.
L.5	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.7, 2016) (L.28, 2015) Consistency	Implement the planned improvement, to allocate the AD and emissions/removals from forest conversion events that occurred before 1990 and that are followed by natural regeneration, in a consistent manner and in accordance with the 2006 IPCC Guidelines.	Not resolved. The Party has reported in the NIR (vol. 2, section 6.5.6) that the improvement of FullCAM regarding the revised allocation inputs will be completed and implemented in the next NIR.
L.6	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.8, 2016) (L.28, 2015) Consistency	In the specific case of subsequent land-use changes within a period shorter than 50 years, base the rule for the allocation of AD and estimates in each reporting year on the end-use category of the land in that year.	Not resolved. The Party has reported in the NIR (vol. 2, section 6.5.6) that the improvement of FullCAM regarding the revised allocation inputs will be completed and implemented in the next NIR.
L.7	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.9, 2016) (L.29, 2015) Completeness	Report emissions/removals occurring throughout the reporting period owing to natural forest regeneration before 1990.	Not resolved. The Party has reported in the NIR (vol. 2, section 6.5.6) that the improvement of FullCAM regarding the revised allocation inputs will be completed and implemented in the next NIR.
L.8	4(V) Biomass burning – CO_2 (L.16, 2016) (L.35, 2015) Comparability	Find ways to report CO_2 immediate emissions resulting from fires in CRF table 4(V) and report subsequent carbon stock changes on these areas as carbon stock changes in CRF tables 4.A–4.E, where	Resolved. The Party reported CO_2 emissions resulting from fires in CRF tables 4(V) and 4.A-4.E where appropriated. For those emissions reported as "IE" in CRF table 4(V) the Party provided information in the documentation box in accordance with

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
		appropriate.	footnote 5 in CRF table 4(V). For emissions that are reported as "IE" the necessary information was explained in CRF table 9.
L.9	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.17, 2016) (L.36, 2015) Accuracy	Make further efforts to find more effective ways to differentiate the impact of non-anthropogenic emissions/removals on the forest carbon dynamics in accordance with the 2006 IPCC Guidelines	Resolved. The Party has reported improved information on the differentiation of the impact of non-anthropogenic emissions/removals on forest carbon dynamics in the 2016 submission. In the current submission the Party improved the information, and a consistent method for identifying non-anthropogenic natural disturbances on all forests including non-temperate forests has been applied. See NIR section 6.4 (p.23) and NIR tables 6.20 (p.39) and 6.23 (p.46).
L.10	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.20, 2016) (L.37, 2015) Accuracy	Either report the actual emissions/removals from wildfires in forest land in the year in which they occur, or find ways to demonstrate in the NIR that the averaging procedure applied does not represent a correction of estimates and how the quality (i.e. accuracy), transparency and comparability of the estimates of forest fires could be improved and the uncertainty reduced by the application of this procedure. In the latter case, the ERT further recommends that Australia include in the NIR the entire time series of both raw (not averaged) and final estimates to ensure transparency and comparability.	Resolved. Australia reported in the current submission the actual emissions/removals from wildfires in forest land in the year in which they occur and is no longer using averaged values for the emission/removal estimates, as in previous NIR submission. The Party has reported in the NIR (vol. 2, section 6.4.1.3) the information on its use of equation 2.18 of the 2006 IPCC Guidelines (vol. 4, chapter 2) and the NIR (section 6.4.1) explains the application of the FullCAM model for the carbon stock change estimations.
L.11	4(V) Biomass burning – CH_4 and N_2O (L.22, 2016) (L.38, 2015) Accuracy	Either report actual emissions/removals from fires in grassland remaining grassland in the year in which they occur, or find ways to demonstrate in the NIR that the averaging procedure applied does not represent a correction of estimates and how the quality (i.e. accuracy), transparency and comparability of the fire estimates on grassland can be improved and the uncertainty reduced by the application of this procedure. In the latter case, the ERT further recommends that Australia include in the NIR the entire time series of both raw (not averaged) and final estimates to ensure transparency and comparability.	Resolved. The Party has reported in the NIR (vol. 2, section 6.8.1.3) the information on using the same methodology as for forest land remaining forest land, as explained above (see ID# L.6 above) and information on the application of the FullCAM model for the carbon stock change estimations.
L.12	4.G HWP – CO_2 (L.24, 2016) (L.40, 2015) Transparency	Improve the transparency of the reporting of harvested wood products by explicitly reporting these carbon losses (related to fuelwood	Resolved. Australia has now included information on the fuelwood consumed in 1995 in the NIR (vol. 2, table 6.65, p.112) in accordance with the UNFCCC Annex I

ID[a]	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
		consumption) in CRF table 4.G (e.g. by using an appropriate subdivision under other (4.G.3)) or alternatively in the NIR.	inventory reporting guidelines.
L.13	4.G HWP – CO_2 (L.30, 2016) Transparency	Complete CRF table 4.Gs.2 and the additional information box on factors used to convert from product units to carbon. Parties can do this by setting a custom node year within the data entry screen for HWP in the CRF Reporter software.	Resolved. CRF table 4.Gs.2 contains AD for 1960–1989 used for the estimation of CO_2 emissions/removals from HWP in use.
Waste			
W.1	5. General (waste) – CO_2, CH_4 and N_2O (W.4, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Implement a new uncertainty analysis in line with the 2006 IPCC Guidelines and update the information and data on the uncertainty analysis.	Resolved. Australia has updated the uncertainty analysis and reported the results in the NIR (annex 2, section A2.5).
KP-LULUCF			
KL.1	Deforestation – CO_2, CH_4 and N_2O (KL.4, 2016) Transparency	Provide in the NIR a transparent description of the methodology used to estimate emissions and removals from deforestation.	Resolved. A description of the method for reporting forest land converted to flooded land is now included in the NIR (vol. 2, section 6.11.1, p.100).
KL.2	Deforestation – CO_2, CH_4 and N_2O (KL.4, 2016) Transparency	Explain how the areas subject to deforestation under the Kyoto Protocol are related to the areas of forest land converted to other land uses under the Convention.	Resolved. Information on how deforestation areas under the Kyoto Protocol relate to areas of forest land converted to other land uses under the Convention is included in the NIR (vol. 3, section 11.4, p.8).
KL.3	Forest management – CO_2 (KL.5, 2016) Accuracy	Consider a longer time series (including the years 1990–2009) for determining the calibration period for applying the natural disturbance provision (e.g. using (part of) the information presented on wildfires for 1850–2009) and avoid restricting the calibration period to 2000–2012.	Addressing. The use of a longer time series including the years 1990–2009, and possibly part of the information on the long-term fire history, is under consideration. This is part of the planned improvements described in the NIR (vol. 3, section 11.6.4, p.30–31).
KL.4	Revegetation – CO_2 (KL.6, 2016) Transparency	Review the preliminary methodology and data sources used for RV and revise them, if appropriate (see also KL.6 below). The ERT further recommends that Australia improve transparency by explaining, in the NIR, the methods and data sources used to estimate the carbon stock changes in revegetation.	Resolved. Information on the methods and data sources used to estimate the carbon stock changes in RV is included in the NIR (vol. 3, section 11.9, p.68).
KL.5	Revegetation – CO_2 (KL.6, 2016) Transparency	Explain how the definition contained in decision 16/CMP.1, annex, chapter C (in conjunction with decisions 6/CMP.9 and 3/CMP.11), for revegetation, is associated with Australia's reporting on the land-use categories under the Convention, and	Resolved. Australia reported in the NIR (vol. 3, section 11.2, p.4) information on the definition of RV and how it relates to land-use categories under the Convention, including how RV activity under Article 3, paragraph 4, of the Kyoto Protocol, (restrict to settlements and wetlands) is distinguished

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		explain how revegetation in settlements and wetlands does not meet the definition of forest.	from AR.
KL.6	Revegetation – CO_2 (KL.7, 2016) Accuracy	Continue to work on updating the sparse woody vegetation data for any remaining map sheets in order to achieve a complete land representation of sparse woody vegetation, as these areas may be subject to revegetation activity under Article 3, paragraph 4, of the Kyoto Protocol.	Resolved. Australia informed the ERT during the review that, in accordance with the information provided in response to ID# KL.4 above, on the definition of RV activity and how it relates to land-use classifications under the Convention, RV activities only occur on wetlands and settlements. As RV does not occur in the rangeland tiles referred to by the ERT, the reporting of RV activities is complete.
KL.7	HWP – CO_2 (KL.8, 2016) Transparency	Document the process for deriving the country-specific half-lives for HWP and provide information to justify that the methodologies used are at least as detailed or accurate as those prescribed in decision 2/CMP.7, annex, paragraph 29.	Addressing. The Party provided a description on the methodology applied, including rates of loss for different product pools and ages of material in use, in the NIR (vol. 2, section 6.15.1 and in table 6.66). A planned improvement is under way to provide a comparison of the results of the tier 3 model with the default half-lives and first-order decay method described in decision 2/CMP.7, annex, paragraph 29.
KL.8	HWP – CO_2 (KL.9, 2016) Transparency	Describe, in the NIR, the methodology used to distinguish HWP from deforestation from AR and from FM. The ERT further recommends that Australia transparently explain that HWP from deforestation is accounted for on the basis of instantaneous oxidation.	Resolved. The information has been provided by the Party in the NIR (vol. 3, section 11.4.3, p. 70).

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 annual submission of Australia, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Australia

ID#	Previous recommendation for the issue identified	Number of successive reviews issue not addressed
General		
	No such general issues were identified	
Energy		
	No such issues for the energy sector were identified	

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
IPPU		
I.2	Confirm or update the CaO and MgO content ratios in order to ensure the accuracy of the values for more recent years and the consistency of the time series	3 (2015–2017)
I.5	Improve the level of transparency used to report disaggregated subcategory emission data for ammonia production, while preserving the legally required confidentiality in the overall reporting of emissions	3 (2015–2017)
I.6	Ensure consistency between the emission levels reported in the IPPU chapter of the NIR and in the key category analysis	3 (2015–2017)
I.7	Investigate whether other drivers could be applied to estimate emissions from lead production, zinc production and other (metal production) for the period 1990–2008, such as production volumes	3 (2015–2017)
I.8	Correct the AD for steel production in the CRF tables and improve the QA/QC tests for the reporting in the NIR and the CRF tables in order to avoid data entry errors	3 (2015–2017)
I.9	Include in the methodological description in the NIR a more accurate description of the methodology used, in particular the use of the vintage stock model	3 (2015–2017)
I.10	Align the calculation method with the definition provided in the NIR, and apply an operational loss of 25 per cent, 50 per cent and 25 per cent, respectively, for use of F-gases as solvents	3 (2015–2017)
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		
L.5	Implement the planned improvement to allocate the AD and emissions/removals from forest conversion events that occurred before 1990 and that are followed by natural regeneration, in a consistent manner and in accordance with the 2006 IPCC Guidelines	3 (2015–2017)
L.6	In the specific case of subsequent land-use changes within a period shorter than 50 years, base the rule for the allocation of AD and estimates in each reporting year on the end-use category of the land in that year	3 (2015–2017)
L.7	Report emissions/removals occurring throughout the reporting period owing to natural forest regeneration before 1990	3 (2015–2017)
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

V. Additional findings made during the 2017 individual inventory review

9. Tables 5 and 6 contain findings made by the ERT during the individual review of the 2017 annual submission of Australia that are additional to those identified in table 3. In accordance with paragraph 76(b) of the UNFCCC review guidelines, the ERT has prioritized in table 5 recalculations that changed the total emissions/removals for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years.

Table 5
Additional findings made during the 2017 individual review of the annual submission of Australia related to recalculations

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue?[a] If yes, classify by type*
General			
G.4	Recalculations	The ERT noted that Australia made recalculations to all sectors in its GHG inventory owing to the implementation of corrections and new rounding policy for EF precision. In response to a question raised by the ERT, Australia explained that its GHG inventory was subject to an independent performance audit by the Australian National Audit Office during 2016/17 and that, as part of a response to the findings of this audit process, the Party developed a new rounding policy for the consideration of AD, EFs and other parameters used. The new rounding policy consists of matching the precision of AD/EFs/parameters with the precision of the principal source. For example, in the agriculture sector, a reconciliation of principal sources for agriculture was undertaken which resulted in a change to a number of parameters used in the calculation of emissions, as follows: (1) feedlot cattle manure management system allocation to anaerobic lagoons; and (2) N_2O EFs for inorganic fertilizer application to irrigated and non-irrigated pasture. This reconciliation also identified incorrectly entered values for: (1) live-weight gain for cows more than 2 years old in Queensland (low rainfall region) in spring; and (2) corrected the MCF for dairy cattle in a 'drains to paddock' manure management system. The ERT welcomes the Party's response and recommends that Australia include in the NIR the description of the new rounding policy for AD, EFs and other parameters to all sectors.	Yes. Transparency
Energy			
E.3	1. General (energy sector) – all fuels, all gases	Recalculations were made to the energy sector that changed the emission/removal estimate by more than 2 per cent and/or national total emissions by more than 0.5 per cent for several categories. However, the ERT did not identify any issues or problems with these recalculations, which were based on the reallocation of fuels to categories within the energy sector (except for fugitive emissions) and so the impact on the national totals is not significant. The Party is working to ensure time-series consistency at the sector level throughout the time period. Major recalculations occurred for category 1.B.2.b (natural gas), mainly in response to a previous recommendation (see ID# E.1 in table 3), with changes in emission estimates of 58.4 per cent for CH_4 and 17.2 per cent for CO_2 in 2014. However, the ERT did not identify any issues or problems with these recalculations.	Not an issue/problem
IPPU			
I.12	2. General (IPPU) CO_2, CH_4 and N_2O	No recalculations made to the IPPU sector changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent.	Not an issue/problem
Agriculture			
A.9	3. General (agriculture)	No recalculations made to the agriculture sector changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent.	Not an issue/problem

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue*[b]*? If yes, classify by type*
	CO_2, CH_4 and N_2O		
LULUCF			
L.14	4. General (LULUCF) – CO_2	Recalculations were made to LULUCF activities for categories 4.A.1 (forest land remaining forest land), 4.A.2 (land converted to forest land), 4.B.1 (cropland remaining cropland), 4.C.1 (grassland remaining grassland), 4.D (wetlands) and 4.E (settlements) that changed the emission/removal estimate by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with these recalculations.	Not an issue/problem
L.15	4.B.2.1 Forest land converted to cropland – 4.C.2.1 Forest land converted to grassland – CO_2	The ERT noted that according to the NIR (vol. 2, pp.91–95), the recalculations for category 4.B.2.1 and 4.C.2.1 were carried out for the entire time series for several reasons, such as enhanced geospatial monitoring, FullCAM tree parameter updates and alignment with sectoral estimation periods. The ERT further noted that these recalculations resulted in a net increase of 4,228 kt CO_2 eq in 2014, owing to a decrease of 263 kt CO_2 eq in 2014 (table 6.41 of the NIR) in forest conversion to croplands and an increase of 4,491 kt CO_2 eq in 2014 (table 6.52 of the NIR) in forest conversion to grasslands, both of which are above the threshold (2 per cent) for these categories. In 2005, the recalculations resulted in a net decrease of 7,351 kt CO_2 eq (1,492 kt CO_2 eq in forest converted to cropland and 5,859 kt CO_2 eq in forest converted to grasslands). Furthermore, the ERT noted that additional explanatory information could be provided in the inventory submission on parameters used for model verification and on notable changes in the trend of recalculated net emission estimates between 2006 and 2014. The ERT acknowledges the responses and comments provided by the Party during and beyond the review period. Owing to the complexity of the nature of recalculations performed by the Party, the ERT was not in a position to fully assess these during the desk review, to determine whether they are appropriate. For better understanding of the application of the FullCAM tree parameter updates and the alignment with sectoral estimation periods, the ERT recommends that Australia enhance the description in the next inventory submission.	Yes. Transparency
Waste			
W.2	5. General (waste) – CO_2, CH_4 and N_2O	No recalculations made to the waste sector changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent.	Not an issue/problem
KP-LULUCF			
KL.9	General (KP-LULUCF) – CO_2	Recalculations were made for the KP-LULUCF activities that changed the emission/removal estimate by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with the recalculations, which are as follows: (a) AR: the Party indicated in the NIR (vol. 3, p.18), that the reason for the recalculation corresponds to that made for LULUCF category 4.A.2 (land converted to forest land);	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a]? If yes, classify by type*
		(b) FM: the Party indicated in the NIR (vol. 3, p.57), that the reason for the recalculation corresponds to that made for LULUCF category 4.A.1 (forest land remaining forest land); (c) CM: the Party indicated in the NIR (vol. 3, p.61), that the reason for the recalculation corresponds to that made for LULUCF category 4.B.1 (cropland remaining cropland); (d) GM: the Party indicated in the NIR (vol. 3, p.66), that the reason for the recalculation corresponds to that made for LULUCF category 4.C.1 (grassland remaining grassland).	
KL.10	Deforestation – CO_2	The ERT noted that according to the NIR (vol. 3, p.11), the description of the recalculations for deforestation is provided in the NIR, volume 2, chapter 6 for forest land converted to grassland. The ERT noted that these recalculations resulted in an increase of 4,363 kt CO_2 eq in 2014, which is above the threshold (2 per cent). The ERT acknowledges the responses and comments provided by the Party during and beyond the review period. Owing to the complexity of the nature of recalculations performed by the Party, the ERT was not in a position during the desk review to fully assess whether they are appropriate. The ERT recommends that Australia enhance the description of the calculations of emissions and removals occurring from deforestation (forest land converted to grassland) in the next inventory submission (see also ID# L.15 above).	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

10. Table 6 contains additional findings made by the ERT during the 2017 individual review that are not covered in table 3 or 5, but are within the scope of the desk review as specified in paragraph 76 of the UNFCCC review guidelines or paragraph 65 of the Article 8 review guidelines and are findings that the ERT wishes to convey to the Party.

Table 6
Additional findings made during the 2017 individual review of the annual submission of Australia

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[b]? If yes, classify by type*
General			
G.5	Article 3, paragraph 14, of the Kyoto Protocol	The ERT noted that it was not clear from the NIR of the 2017 submission what changes have occurred to the information provided in accordance with Article 3, paragraph 14, if compared to the previous inventory submission. During the review, Australia explained that the changes are detailed in the section titled "How Australia addresses the international impacts of response measures" in the NIR (vol. 3, chapter 15). However, the ERT is of the view that the Party should better clarify the changes between the previous and the current submission. The ERT recommends that Australia identify any changes to the information reported in accordance with Article 3, paragraph 14, when compared with the previous inventory submission.	Yes. Reporting under Article 7, paragraph 1, of the Kyoto Protocol
G.6	Emission factors	The ERT noted that in CRF table summary 3, Australia reported the use of default EFs with the use of a tier 2 method to estimate emissions; for example, CO_2 emissions from category 1.A.3 (transport sector) and 4.G (HWP), CH_4 emissions from categories 2.B (chemical industry), 3.B.3 (manure management from swine) 5.A (solid waste disposal) and 5.D (wastewater treatment and discharge), and N_2O emissions in category 3.B. The ERT further noted that the application of a tier 2 method may not be consistent with the use of default EFs. In response to a question raised by the ERT, Australia explained that it uses a combination of default and country-specific EFs. All default EFs used in these categories have been reviewed for their appropriateness to the national context, effectively making them country-specific EFs. The Party noted that, for transparency, it continues to refer to such EFs as default EFs. In response to the draft annual review report, the Party further explained that the use of default EFs with tier 2 methods is applied to estimate minor components of sources; for example, under category 1.A.3, CO_2 emissions for fuel oil from category 1.A.3.d (water borne navigation – domestic) and CH_4 emissions from petrochemical and carbon black production under category 2.B. The Party explained that the assessment of the representativeness of the fuel oil EF for CO_2 in category 1.A.3.d is included in the NIR (vol. 1, section 3.2.1) and that the EF is reported as a default for transparency reasons; however, the EF is a country-specific EF given its independent verification conducted by Orbital Australia (NIR, vol. 1, p.45) and therefore Australia will update NIR table 3.14 (p.71) to reflect that the CO_2 EF for category 1.A.3.d is country-specific. The Party further explained that for category 4.G it used a tier 3 approach for HWP, and while the conversion of carbon stock change is universal (or default), the basic density of timber is either taken from literature or adjusted to the weight of the final product, and the carbon content factor is taken from Gifford (2000a) (see NIR, vol. 2, section 6.15.1 and shown in NIR table 6.64, p.111). For N_2O from category 3.B Australia uses country-specific N excretion rates and the choice of EFs does not enter into the consideration in this case, therefore this approach is consistent with the tier 2 approach. For category 3.B.3, the default EF refers to the Bo value, that is adjusted according to country-specific parameters and is used universally by all Parties. The ERT accepts the explanation provided by Australia and the use of "default" EF for categories 4.G, 3.B.3 and N_2O from category 3.B and therefore no further action is needed by the Party. For the other categories, the ERT recommends that	Yes. Transparency

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[b] If yes, classify by type*
		Australia document and justify the appropriateness of the default EFs for CH_4 emissions from categories 2.B and 5.D. The ERT further recommends that Australia derive country-specific EFs for those cases where the default EFs are applied for key categories of the national inventory and it is impossible to justify the appropriateness of their use. The ERT further recommends that Australia correctly note the use of country-specific factors where a default value has been assessed as being appropriate for Australia.	
G.7	Uncertainty analysis	Australia reported the uncertainty assessment in NIR tables 2A.1 and 2A.2, (vol. 3, annex 2, p.119). The ERT noted that the information on GHGs in column B of tables 2A.1 and 2A.2 was provided either as CO_2 eq, or as a specific gas (e.g. CO_2, CH_4). For example, in NIR table A2.1, the CO_2 eq instead of the specific gases was reported for category 1.A.1.a (electricity generation) for black coal, brown coal and natural gas); while for category 1.A.1.a (electricity generation – liquid fuels) the mass of particular gases (CO_2 ,CH_4 and N_2O) is reported. The ERT further noted that, in accordance with the 2006 IPCC Guidelines (vol. 1, chapter 3) the uncertainty analysis has to be performed by category and by gas and not the using the CO_2 eq as indicated in the 2006 IPCC Guidelines (vol. 1, chapter 3, column B of tables 3.2 and 3.3) . The ERT is of the view that the combination of CO_2 eq and specific GHGs in the uncertainty analysis may affect the comparability of the uncertainty values included in the estimates, lead to additional ambiguity and finally result in an incorrect estimate of the overall uncertainty. The ERT recommends that Australia undertake the inventory uncertainty analysis on a gas-by-gas basis using the particular GHGs as recommended by the 2006 IPCC Guidelines, or provide transparent information that the procedures used are in accordance with the 2006 IPCC Guidelines.	Yes. Comparability
G.8	Uncertainty analysis	Australia reported the inventory uncertainty analysis in NIR tables A2.1 and A2.2 (vol. 3, annex 2). The ERT noted that, in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 15, Parties are required to report "the uncertainties for at least the base year and the latest inventory year and the trend uncertainty between these two years". In response to a question raised by the ERT, Australia clarified that the uncertainty for the base year was not included in the NIR and provided the uncertainty estimate for the base year as ±7.9 per cent (including LULUCF) and ±4.0 per cent (excluding LULUCF). The ERT recommends that Australia include information on the base-year uncertainty assessment in the next inventory submissions.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
Energy			
E.4		No further issues identified.	
IPPU			
I.13	2. General (IPPU)	Australia reported in NIR table 4.2 (p.173) that a tier 1b method is used for the estimation of CO_2 emissions under category 2.B.1 (ammonia production), 2.C.1 (iron and steel production) and 2.C.3 (aluminium production) and that a tier 1c method is used for the estimation of PFC emissions under category 2.C.3 (aluminium production). The ERT noted that the 2006 IPCC Guidelines do not provide tier 1b methodologies for CO_2 emissions under categories 2.B.1, 2.C.1 and 2.C.3 or tier 1c	Yes. Adherence to the UNFCCC Annex I inventory reporting

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
		methodologies for PFC emissions under category 2.C.3. During the review the Party indicated that in all cases tier 3 methodologies had been used for emission estimates and that the tier levels mentioned in NIR table 4.2 refer to tier levels from the Revised 1996 IPCC Guidelines and that they will be updated in its next submission.	guidelines
		The ERT recommends that Australia refer to the correct tier levels in NIR table 4.2 for CO_2 emissions in categories 2.B.1 and 2.C.1 and for CO_2 and PFC emissions in category 2.C.3, in accordance with the 2006 IPCC Guidelines.	
I.14	2.D.1 Lubricant use – CO_2	The ERT noted that CRF table 2(I)A-Hs2 shows a CO_2 IEF of 0.00053 t CO_2/t for lubricant use in 2015. During the review, the Party confirmed that a wrong unit was used when the value was entered into the CRF table and that the correct value of the CO_2 IEF should be 0.53 t CO_2/t.	Yes. Accuracy
		The ERT recommends that the Party correct the CO_2 IEF in CRF table 2(I)A-Hs2 and verify whether CO_2 emission estimates are accurate and provide information about the results in the next submission.	
I.15	2.A.4 Other process uses of carbonates – CO_2	The ERT noted that CRF table2(I)A-Hs1 shows a CO_2 IEF of 0.00048 t CO_2/t of carbonate use (category 2.A.4.d (other)). During the review, the Party confirmed that a wrong unit was used when the value was entered into the CRF table and that the correct value should be 0.48 t CO_2/t of carbonate use.	Yes. Accuracy
		The ERT recommends that the Party correct the CO_2 IEF in CRF table 2(I)A-Hs1 and verify whether CO_2 emission estimates are accurate and provide information about the results in the next submission.	
I.16	2.B.1 Ammonia production – CO_2	Australia reported in the NIR (section 4.4.1, p.190) that "a portion of CO_2 emissions arising from ammonia production are recovered for use in the production of urea" and that "emissions from the production and use of urea are included with the emissions from ammonia (category 2.B.1) in accordance with good practices". The ERT noted that, at the same time, Australia also reported CO_2 emissions from urea use under the agriculture sector, in category 3.H (urea application) using a tier 3 method for AD (i.e. plant-level natural gas consumption). The ERT noted that potential double counting might be occurring. During the review the Party indicated that CO_2 emissions from the use of urea are subject to a small double counting, with emissions being included in both the production and the use of urea produced in Australia and that this will be corrected in the next submission. The Party also explained that the reporting of CO_2 emissions from urea consumption in agriculture (category 3.H) was introduced in 2015 and a correction to the reporting of CO_2 from ammonia was not made. Data on urea consumption is provided annually by Fertilizer Australia and includes domestic and imported urea. The vast majority of urea consumed in Australia is from imported sources (over 88 per cent in 2015). The consumption of domestically produced urea in the agriculture sector amounted to 6.4 Gg CO_2 in 2015, which represents an overestimation of national GHG emissions (without LULUCF) of 0.0012 per cent.	Yes. Accuracy
		The ERT recommends that the Party correct the double counting of CO_2 emissions in urea production and use by excluding from ammonia production (category 2.B.1) the CO_2 emissions recovered for use in the production of urea and by reporting such emissions in accordance with the 2006 IPCC Guidelines (vol. 3, chapter 3, box 3.2).	
I.17	2.B.1 Ammonia production –	Section 4.4.10 of the NIR "Source specific QA/QC" (for chemical production) indicates that the quantity of CO_2 generated per tonne of ammonia produced has been compared with that of Annex I Parties reporting emissions from ammonia	Yes. Adherence to the UNFCCC

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
	CO_2	production (t CO_2/t ammonia produced). The majority of Parties fall into a range of 0.44–0.52 t CO_2/t ammonia produced, according to figure 4.4 of the NIR. Below figure 4.4. it is stated in the text that "The IEF for ammonia production for Australia ranges between 1.181 t CO_2 and 1.544 t CO_2 per tonne of ammonia produced." On the same page it is stated that "Statistical analysis indicates that the IEF for ammonia production for Australia is not significantly different to the factors reported by other Annex I parties." However, the ERT noted that the IEF range indicated by the Party for ammonia production is 2–3 times higher than the factors reported by other Annex I Parties as presented in figure 4.4. During the review the Party indicated that this was an editorial error during the graphic design process and that figure 4.4 was generated with data from figure 4.3 (carbonate consumed), and provided to the ERT the correct figures. The ERT recommends that the Party correct figure 4.4 in the NIR to reflect the correct CO_2 generated per tonne of ammonia produced.	Annex I inventory reporting guidelines
I.18	2.G.3 N_2O from product uses – N_2O	Australia indicated in the NIR (section 4.4.2, p.192), in response to a previous recommendation, that N_2O emissions from product uses are estimated based on imports in addition to domestic production (see ID# I.11 in table 3). However, during the review the ERT noted that in NIR table 4.3 (p.176), the consumption of N_2O from product use is estimated based on company surveys, but there is no indication of whether this covers imports as well. In response, the Party clarified that, prior to 2003, it is assumed that all consumption of N_2O was derived from domestic production. From 2003 onwards, one of the two N_2O producing plants in Australia ceased production and imports of N_2O commenced, and N_2O emissions from product uses are estimated based on imports in addition to domestic production. In addition, Australia clarified that while it is known that imports are occurring, actual import data are not available and therefore emissions are estimated using a per capita usage factor assumed to include imports and domestic production throughout the time series. The ERT noted that the Party has not explained in the NIR the fact that a per capita usage factor is used to include imports and also that the Party does not provide a justification as to how it has ensured that the usage factor includes imports. The ERT recommends that the Party include an explanation in the NIR that no AD information on N_2O imports is available and emissions are estimated using a per capita usage factor assumed to include imports and domestic production throughout the time series. The ERT also recommends that the Party explain in the NIR the methodology used for estimating N_2O imports based on the per capita usage factor and verify if no underestimation/overestimation of emissions occurs and report the results in the NIR.	Yes. Accuracy
Agriculture			
A.10	3. General (agriculture)	Australia reported in the NIR (vol. 1, section 5.3.7, p.271) source-specific QA/QC procedures and improvements that have been applied in the agriculture sector (enteric fermentation). The ERT noted that NIR table 5.11 presents the comparison of the country-specific EFs used by the Party for enteric fermentation with the IPCC default values. The ERT noted that the IPCC default ranges presented in this table are taken from earlier versions of the IPCC Guidelines. During the review, the Party acknowledged the use of the incorrect values and informed the ERT that it will update the EFs in accordance with the 2006 IPCC Guidelines in the next submission. The ERT recommends that Australia update the default EFs in NIR table 5.1.1 in accordance with the 2006 IPCC Guidelines.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[c]? If yes, classify by type
A.11	3. General (agriculture)	The ERT noted that the expert judgment applied in the agriculture sector to determine country-specific AD, EF or parameter information (NIR vol. 1, section 5.2.1, p.262) was not documented in accordance with the 2006 IPCC Guidelines (vol. 1, chapter 2, table 2A.1). In response to a request from the ERT, Australia provided additional information on documenting the expert judgment, including the supporting literature referred to in section 5.2.1. The ERT encourages Australia to document in the NIR the expert judgment used in line with the 2006 IPCC Guidelines (vol. 1, chapter 2, table 2A.1), for example, through the provision of, or reference to, external documents containing the expert judgment protocols, minutes of panel meetings, reports, peer-reviewed articles etc.	Yes. Transparency
A.12	3. General (agriculture)	Australia reported in NIR table 5.3 that the data for estimating inorganic fertilizer emissions are collected from Fertilizer Australia (previously known as Fertilizer Industry Federation of Australia). During the review, Australia clarified that Fertilizer Australia is the industry association representing manufacturers, importers and distributors of fertilizer. Australia also explained that a comparison with FAO data on inorganic N application is performed for each inventory submission as part of the QC process and differences are typically less than 1 per cent. A follow-up question was raised to clarify whether Fertilizer Australia is the national official source and is the national agency reporting at the international level (e.g. FAO, UN Comtrade) and whether it implements a QC process for data collection. In response, Australia explained that the inventory uses the same data source as the FAO for fertilizer consumption. Australia uses data directly from Fertilizer Australia as it provides the elemental content of fertilizer. The FAO data source is from the Australian Bureau of Agricultural and Resource Economics, whose fertilizer consumption data are sourced from Fertilizer Australia. Therefore, Australia's and FAO results are derived from the same data. The ERT encourages Australia to improve the information on the QC process performed between the fertilizer consumption data used in the inventory and the FAO data for inorganic N application by including a clarification of the data sources used by FAO and in the inventory and the possible reasons for the difference between these data.	Not an issue/problem
A.13	3. General (agriculture) – CH_4 and N_2O	In response to a previous recommendation (see A.1 in table 3) Australia provided in the NIR (section 5.3.2.2, p.265) an explanation of the approach and assumptions used to derive the average annual livestock populations. However, during the review the ERT noted that Australia derived annual livestock population of cattle (taken from the Australian Bureau of Statistics) by adjusting the numbers of cattle for an annual equivalent number of animals held on feedlots (NIR, vol. 1, p.262). Further details of the annual equivalent derivation methods are provided on page 266 of the NIR but the reasons for adjustments have not been provided in the NIR. During the review, Australia explained that the feedlot cattle, on average, spend between 70 and 250 days on feedlots prior to slaughtering. With this, the annual equivalent population number is derived using an approach consistent with equation 10.1 in the 2006 IPCC Guidelines (vol. 4, chapter 10) and subtracted from beef cattle numbers. For example, feedlot cattle processed for domestic purposes spend 75 days on average in the feedlot. An annual equivalent population is derived by applying a multiplier of 0.21 (75/365). The ERT recommends that Australia explain in the NIR the reasons for adjusting the numbers of cattle and the assumptions considered per animal species in order to obtain the annual equivalent number of animals held on feedlots.	Yes. Transparency
A.14	3.A Enteric	Australia reports in the NIR (section 5.3.7.5, p.273) on the external review conducted by agricultural experts from industry,	Yes. Transparency

ID	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem? If yes, classify by type
	fermentation – CH_4	government and academia on the agriculture sector; however, the ERT noted that NIR table 1.4 (p.16) lists additional expert reviews carried out for methodologies and data in the agriculture sector in 2015 (e.g. the review of agriculture, cropland and grassland methods in 2015). The ERT asked for clarification on the documentation and main recommendations derived from this review and the status of implementation of those recommendations. In response, Australia provided information on the FullCAM (used to ensure consistent use of methods across the time series) and the Agriculture Inventory Expert Advisory Panel. Australia mentioned that an important outcome from the work of this panel was to consider and endorse for use in the inventory the research on enteric fermentation from cattle published in Charmley et al. (2015). Australia also shared some further documents, including a non-public document *Dairy Technical Working Group 2015*, which includes a list of recommendations. The ERT also noted that most recommendations have been implemented, for example, on animal characteristics as can be seen in NIR appendix 5A. The ERT commends Australia for its efforts in continuously improving estimations. However, the ERT recommends that Australia include in the NIR information on the conduct and results of the quality assurance reviews of FullCAM (related to the review of agriculture, cropland and grassland) and on the Agriculture Inventory Expert Advisory Panel, in particular, providing information on: (1) the review recommendations outcomes; (2) status of implementation of those recommendations; and (3) reference.	
A.15	3.A.4 Other livestock – CH_4	Australia reported in table 5.10 of the NIR (p.270) that the country-specific EFs (tier 2) for emus/ostriches were derived based on the assumption that the size and anatomy of these animals was equal to half of that of a goat. The ERT noted that emus/ostriches and goats have different digestive systems and the 2006 IPCC Guidelines provide in table 10.10 (vol. 4, chapter 10) a note on an approach for deriving approximated EFs using a tier 1 EF for an animal with similar digestive system and based on a weight ratio. During the review, Australia clarified that enteric fermentation EFs for emus/ostriches were determined by an expert working group. This determination was based on the enteric fermentation EFs for goats in the 2006 IPCC Guidelines based on size and anatomy. The body weights for an emu and an ostrich were determined to be comparable to that of a goat. The EF was then halved to take into account that emus and ostriches are not ruminants like goats, and therefore, their digestive process functions differently, but no justification for this calculation was provided. The ERT noted that in accordance with the 2006 IPCC Guidelines (vol. 4, chapter 10.2.4) data and methods used to characterize the animals should be well documented when developing a country-specific EF. The ERT recommends that Australia describe in the NIR a justification of the methodology used to identify the country-specific EFs for emus/ostriches in accordance with the 2006 IPCC Guidelines (vol. 1, chapter 2, table 2A.1); for example, by providing a summary or references in the NIR to the available information on the expert judgment (reports or peer review); or revise the methodology in accordance with the 2006 IPCC Guidelines (vol. 3, chapter 10.2.4).	Yes. Accuracy
A.16	3.B.1 Cattle – CH_4	Australia estimated CH_4 emissions (NIR, section 5.4.2.1, p.277) from manure management (category 3.B.1.a– dairy cattle), using a tier 2 method and considering the maximum Bo default value for Oceania (0.24 m^3 CH_4/kg VS) as contained in the 2006 IPCC Guidelines (vol. 4, chapter 10, table 10A-4). During the review, Australia explained that it will consider efforts to obtain a country-specific value for Bo for dairy cattle in the context of competing inventory development priorities and resource constraints.	Not an issue/problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[b] If yes, classify by type
		The ERT encourages the Party to make efforts to develop country-specific Bo values for dairy cattle.	
A.17	3.B.1 Cattle – CH_4	Australia estimated CH_4 emissions from manure management (category 2.B.1.c (beef cattle – feedlot)) using a tier 2 method and considering the Bo default value for North America (0.19 m^3 CH_4/kg VS) from the 2006 IPCC Guidelines (vol. 4, chapter 10, table 10A-5), following recommendations provided in the technical report Wiedemann et al. (2014). During the review, Australia indicated that there are currently no plans to collect data to derive country-specific values for this parameter because the review of beef cattle parameters undertaken by Wiedemann et al. in 2014 recommended this value as the most appropriate for application in Australia and as such, provides an independent validation of the value. The ERT noted that the 2006 IPCC default value for North America (0.19 m^3 CH_4/kg VS) is related to an animal mass value of 389 kg. In CRF table3.B(a)s1 the typical animal mass average for beef cattle – feedlot is equal to 537 kg, which is notably higher than for the mass of animals for which the default EF is proposed. In response, Australia explained that the value of Bo is independent of the mass of the animal in question as it reflects CH_4 per kg VS and that estimates of total emissions do reflect animal size, because the VS output used in the inventory is a function of the live weight of Australian animals; so, in fact, total emissions from this source do reflect animal mass. The ERT partially agreed with the explanation provided by Australia, because, for a country-specific Bo value the VS is estimated based on feed intake and digestibility. The ERT also noticed that category 3.B.1 (cattle) is a key category as per the information contained in the NIR (annex 1, table A1. 6) and that, in accordance with the 2006 IPCC Guidelines (vol. 4, chapter 10, p.10.43), the maximum CH_4-producing capacity of the manure varies by species and diet. Therefore the ERT encourages the Party to make efforts to develop country-specific CH_4-producing potential values for beef cattle.	Not an issue/problem
A.18	3.B.3 Swine – CH_4	Australia estimated CH_4 emissions from manure management – swine using a tier 2 method and considering the Bo default value for Oceania (0.45 m^3 CH_4/kg VS) from the 2006 IPCC Guidelines (vol. 4, chapter 10, table 10A-7). During the review, Australia explained that it will consider efforts to obtain a country-specific value for Bo for swine in the context of competing inventory development priorities and resource constraints. The ERT encourages the Party to make efforts to develop country-specific CH_4-producing potential values Bo for swine.	Not an issue/problem
A.19	3.C Rice cultivation – CH_4	The ERT noted that in NIR section 5.5.2 the Party uses a default EF (1.30 kg CH_4/ha per day) which, multiplied by an average of the 150 days of a growing season, gives an emission rate for Australia (195 kg CH_4/ha). The ERT noted that the 2006 IPCC Guidelines (vol. 4, section 5.5.1, p.5.48) recommends that the tier 1 method also use scaling factors to adjust the EF to account for various conditions such as the water regimes and the type and amount of organic amendments. During the review, Australia provided the ERT with the scaling factors applied (SFw=1, SFp=1, SFo=1) and explained that the original source for the 150-day continuously flooded growing season is provided by expert advice and obtained from the National Greenhouse Gas Inventory Committee of Australia. These operational characteristics are also supported by information from the Ricegrowers Association of Australia, including information that rice is planted in October and harvested in March and is grown using flood irrigation. The ERT recommends that Australia include in the NIR the scaling factors used, including a justification for the scaling	Yes. Transparency

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[25] If yes, classify by type*
		factors used for the average growing season.	
A.20	3.D.a.6 Cultivation of organic soils (i.e. histosols) – N_2O	The ERT noted that the area of cultivation of organic soils reported in CRF table 3.D (4,000.00 ha) is different from the one reported to FAO (88,303 ha) (available at http://www.fao.org/faostat/en/#data/GV). During the review, Australia explained that the national reference used for calculating the area of organic soils is the Australian Soil Classification and that this reference maps the total area of histosols in Australia. Soil taxonomists use this map to calculate the area of cultivated histosols that is used in the GHG inventory. Australia also explained that the reason for the difference between national and FAO data arises from the inclusion in the FAO data of a significant area of histosols in Tasmania. However, this land is not cultivated, and therefore is not included in the Party's calculation of cultivated histosols. The ERT encourages Australia to explain in the NIR the differences between the FAO and inventory data, that is, that data used in the GHG inventory do not include the area of histosol in Tasmania because this land is not cultivated.	Not an issue/problem
LULUCF			
L.16	4. General (LULUCF) – Gen	Australia reported areas and changes in areas in CRF table 4.1 for the entire time series. However, the ERT noted that such data do not represent the annual changes in areas of land-use categories between the previous and the current inventory year. For instance, for 2015 the Party reported in CRF table 4.1 the area of 3,826.84 kha for grassland converted to forest land (category 4.A.2.2), and 2,200.65 kha for forest land converted to cropland (category 4.B.2.1). However, the ERT noted that these values are cumulative as can be seen in CRF tables 4.A and 4.B; and in CRF table 4.1 the annual change and not the cumulative value should be presented. The ERT recommends that the Party correct the annual changes data for land-use categories between the previous and the current inventory year in CRF table 4.1 for all categories.	Yes. Comparability
Waste			
W.3	5.B.1 Composting – N_2O	The ERT noted that the CH_4 and N_2O EFs used for composting are referenced to Amlinger et al. (2008) and are presented as CO_2 eq (NIR table 7.16, p.253). During the review, the ERT noted that while the CH_4 IEF in CRF table 5.B (0.75 g CH_4/kg waste) matched the reference provided by Australia in NIR table 7.16 (0.019 t CO_2 eq/t waste), the N_2O IEF did not match (0.0065 g N_2O/kg waste in CRF table 5.B and 0.002 t CO_2 eq/t waste). During the review, Australia informed the ERT that an inconsistency had been discovered in the calculation and provided the ERT with a revised calculation spreadsheet with the corrected EF (0.029 t CO_2 eq/t waste). The ERT agreed with the explanation and noted that the impact of the change was below 0.05 per cent of the national total. The ERT recommends that Australia recalculate the N_2O emissions from composting in the next submission using the correct EF and ensure that the recalculations are adequately described in the NIR.	Yes. Accuracy
W.4	5.B.1 Composting – CH_4 and N_2O	Australia reported in the NIR (section 7.4, p.252) that AD for composting is based on survey data for 2004–2010, and that data have been extrapolated back to 1990. It was not clear to the ERT how AD for 2011–2015 have been estimated and why a different rate of growth for the AD is observed before and after 2011.	Not an issue/problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
		During the review, Australia informed the ERT that the AD for 2011–2015 have been extrapolated using the per capita value from the survey data for 2004–2010 and national population estimates (composting and population has a correlation coefficient of 0.97). Derivation of AD prior to 2004 was performed using linear extrapolation. The ERT noted that the extrapolation methods used for the period before and after the survey yield very different trends. Furthermore, the ERT is not convinced that population growth is the best proxy for extrapolating the extent of composting as a waste management practice because the increasing popularity of composting as a waste management system is probably not connected to a population increase, which thus makes population growth a poor proxy for extrapolating the AD for composting. The ERT encourages Australia to provide more information in the NIR on the trend of AD for composting and the choice of proxy for extrapolating AD after 2010, justifying why it is the most appropriate driver for determining the amount of waste composted.	
W.5	5.B.2 Anaerobic digestion at biogas facilities – CH_4	In the 2017 submission, AD and emissions from anaerobic digestion are reported as "NO" in CRF table 5.B for the entire time series. The NIR (section 7.4, p.252) states that it is an emerging technology in Australia. The ERT notes that online resources (e.g. http://www.worldbiogasassociation.org/wp-content/uploads/2017/07/WBA-australia-4ppa4_v1.pdf) report that digesters based on agricultural waste, industrial waste and biowaste are operating in Australia. During the review, Australia stated that it continues to monitor progress in this area of waste treatment. The Party further stated that the majority of these facilities occur at landfills and wastewater treatment plants; the red meat industry is covered under industrial wastewater; and manure treatment from livestock is covered under agriculture. Of the biological solid waste treatment facilities reporting under the NGER system, none report AD for anaerobic digestion. The ERT recommends that Australia provide more information in the NIR regarding anaerobic digesters, including the number of anaerobic digesters, where anaerobic digestion takes place, and on where this activity is already included in other categories and estimate emissions in cases where AD for anaerobic digestion in solid waste treatment facilities exist.	Yes. Transparency
W.6	5.D.1 Domestic wastewater – N_2O	The NIR (section 7.6.2.1, p.262) states that EFs from the IPCC good practice guidance are used rather than default values from the 2006 IPCC Guidelines. During the review, Australia explained that a country-specific approach is used to estimate N_2O emissions from wastewater treatment and discharge, which takes account of separate processes of nitrification and denitrification taking place in rivers and estuaries; and that the IPCC good practice guidance provides disaggregated factors to enable this country-specific approach to be taken; and that the factors are taken from the agriculture chapter of the IPCC good practice guidance (p.4.73). The ERT notes that the 2006 IPCC Guidelines contain revised information compared with the data from the IPCC good practice guidance; for example, the 2006 IPCC Guidelines (vol. 4, chapter 11, p.11.24, footnote 23) provide a revised EF for rivers. The ERT therefore considers that Australia might overestimate N_2O emissions from wastewater treatment. The ERT recommends that Australia apply the EFs from the 2006 IPCC Guidelines or provide justification in the NIR that the EFs contained in the IPCC good practice guidance better reflect Australian conditions.	Yes. Accuracy

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[20] If yes, classify by type*
W.7	5.D.1 Domestic wastewater – CH_4	Based on the description in the NIR (section 7.6.2.2, p.265), the calculation of emissions from on-site treatment of wastewater is unclear. The MCF is reported in the NIR as 0.15; however, septic tanks are mentioned and this technology has an MCF of 0.5 in the 2006 IPCC Guidelines. The NIR also does not contain information on the share of the population not connected to the sewer system. During the review, Australia provided information on the share of the population not connected to the sewer system. Australia also stated that the MCF of 0.15 was considered appropriate for Australian conditions by experts on the National Greenhouse Gas Inventory Committee and that this factor has been in use since the inception of the inventory and there has been no information to suggest that these systems have changed since the original factor was adopted. The ERT notes that changing the MCF to the IPCC default will not result in a change greater than 0.05 per cent of the national total. The ERT recommends that Australia provide documentation showing that an MCF for septic tanks of 0.15 is appropriate for Australian conditions. In the absence of such documentation, the ERT recommends that Australia apply the 2006 IPCC Guidelines default MCF factor of 0.5 for the waste treated in septic tanks. The ERT further recommends that the Party provide in the NIR the share of the population not connected to the sewer system.	Yes. Accuracy
W.8	5.D.1 Domestic wastewater – CH_4	The NIR (section 7.6.2.1, p.262) states that for wastewater treatment plants, where specific data are available, the COD per person is 0.677. Furthermore, it is stated that for the remaining wastewater a country-specific value of 0.0585 per person is used. This value is referenced to a study by the National Greenhouse Gas Inventory Committee (1995). The ERT noted the large difference between the two values and raised a question on this. Australia responded that a transcription error had occurred in the NIR and that the correct value for COD per person should be 0.069 rather than 0.677. Australia explained that there is a proportion of the wastewater treatment sector where no facility-specific data are available under the NGER system and the choice of parameters applicable to the residual portion of the sector was made in accordance with the decision tree described in section 1.4.1 of the NIR. Each of these facilities will have a unique set of operational circumstances and COD sources and are therefore not considered representative of those facilities not captured under the NGER system. The ERT recommends that Australia correct the value for COD per person in the NIR and explain how Australia determines the COD per person for the portion of AD obtained from the NGER system as well as from facilities not captured under NGER.	Yes. Transparency
W.9	5.D.2 Industrial wastewater – CH_4 and N_2O	Australia reported in the NIR (section 7.6.3, p.268) that the quantity of organic waste in wastewater is obtained under the NGER system for 2009 onwards and, where available, the quantity of COD treated at each facility has been taken from direct measurements reported under the NGER system. NGER data are used where industry coverage is considered sufficient to provide a representative picture of wastewater treatment practices in a given industry (i.e. the pulp and paper, beer and sugar, dairy, meat and poultry, wine, fruit and vegetables and organic chemicals industries). Where facility-specific data under the NGER system are unavailable, estimates are based on country-specific wastewater and COD generation rates as shown in NIR table 7.24. Australia also states in the NIR that no on-site wastewater treatment occurs outside NGER reporting for pulp and paper production, sugar production and beer production. Based on the description in the NIR, it is not clear to the ERT how the Party ensured that CH_4 and N_2O emission estimates are complete, more specifically how measured COD data	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[a]? If yes, classify by type
		obtained under the NGER system are used in conjunction with the country-specific COD generation rates for industrial wastewater as presented in NIR table 7.24. In addition, it was not clear to the ERT how the production amount (tonnes or litres) of a certain commodity (e.g. pulp and paper, beer, sugar.) matched the wastewater amount reported in NGER to allow for the calculation of a residual commodity production (tonne or litres) that is not covered by the NGER system. During the review, Australia explained that the wastewater amounts reported in NGER are tied to a commodity production amount and therefore it is possible to subtract this production from the total national production statistics. Australia also provided the ERT with a spreadsheet showing the total commodity production and the production covered by NGER and the COD concentration under the NGER system. The ERT recommends that Australia include in the NIR information on how measured COD data obtained under the NGER system are used in conjunction with the country-specific COD generation rates for industrial wastewater and clarify how the commodity production amount matched the wastewater amount reported in NGER for the calculation of a residual commodity production (tonnes or litres) that is not covered by NGER. Additionally, the ERT recommends that Australia explain in the NIR the background for the assumption that no on-site wastewater treatment occurs outside NGER reporting for pulp and paper production, sugar production and beer production.	
KP-LULUCF			
KL.11	Revegetation – activity data	The Party reported in the NIR (vol. 3, section 11.9.3.4), that currently available data only support modelling of estimations of aggregated carbon stock changes from RV. These represent changes across all five carbon pools; however, they are reported under above-ground biomass, as this reflects the most significant pool for this activity. During the review, the Party indicated that it has not excluded any pools from accounting, and therefore the NIR remains consistent with chapter 2.3.1 of the Kyoto Protocol Supplement. Australia has elected end of commitment period accounting for this activity. Planned improvements are under way to bring this activity into alignment with Australia's FullCAM tier 3 spatial modelling approach used for most KP-LULUCF activities. The ERT recommends that the Party provide in the annual submission information on progress made in the planned improvements to report carbon stock changes from individual pools and align the calculations for revegetation with Australia's FullCAM tier 3 spatial modelling approach used for most KP-LULUCF activities.	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as identified in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of Australia.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. Australia has elected annual accounting for AR. Annex I shows the accounting quantities for KP-LULUCF activities as reported by the Party and the final values after the review. The final quantity of units to be issued and cancelled are presented in the same annex.

13. Australia has elected commitment period accounting for FM, CM, GM and RV and therefore the issuance and cancellation of units for activities under Article 3, paragraph 4, of the Kyoto Protocol are not applicable for the 2017 review.

VIII. Question of implementation

14. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Australia for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Australia

1. Tables 7–10 provide an overview of total GHG emissions and removals as submitted by Australia.

Table 7
Total greenhouse gas emissions for Australia, base year[a]–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								4 700.00
Base year	579 348.01	419 843.16	NA	NA	148 163.36		7 144.67	
1990	579 348.01	419 843.16	NA	NA				
1995	490 538.91	435 383.82	NA	NA				
2000	551 257.03	484 841.72	NA	NA				
2010	562 037.03	537 159.26	NA	NA				
2011	556 618.78	538 544.09	NA	NA				
2012	535 147.47	541 258.26	NA	NA				
2013	523 665.34	531 325.63	NA	NA		23 343.24	–3 552.79	–21 643.96
2014	526 815.74	525 792.13	NA	NA		20 978.65	7 004.80	–23 080.71
2015	525 565.07	533 282.71	NA	NA		18 523.85	4 437.52	–18 393.56

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year for CM, GM and RV under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Australia. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has not reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

Table 8

Greenhouse gas emissions by gas for Australia, excluding land use, land-use change and forestry, 1990–2015

(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3
1990	278 352.79	119 920.32	15 327.33	1 424.68	4 607.01	NO	211.02	NO
1995	305 260.84	111 415.28	15 870.53	1 004.03	1 530.84	NO	302.31	NO
2000	349 983.94	112 817.56	18 949.31	1 613.20	1 287.06	NO	190.65	NO
2010	406 810.74	102 429.96	19 348.15	8 166.07	283.32	NO	121.03	NO
2011	404 273.38	104 757.70	20 248.85	8 837.85	301.30	NO	125.00	NO
2012	407 140.01	103 957.65	20 385.10	9 353.07	294.88	NO	127.55	NO
2013	398 292.63	102 870.34	19 807.59	10 034.13	192.00	NO	128.94	NO
2014	393 572.07	100 911.25	20 199.32	10 787.35	192.54	NO	129.61	NO
2015	402 159.57	100 895.03	18 442.60	11 482.74	171.32	NO	131.45	NO
Per cent change 1990–2015	**44.5**	**–15.9**	**20.3**	**706.0**	**–96.3**	**NA**	**–37.7**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Australia did not report indirect CO_2 emissions in CRF table 6.

Table 9

Greenhouse gas emissions by sector for Australia, 1990–2015

(kt CO_2 eq)

	Energy	IPPU	Agriculture	LULUCF	Waste	Other
1990	293 925.73	26 080.61	80 178.51	159 504.86	19 658.31	NO
1995	318 661.30	25 270.80	72 855.80	55 155.09	18 595.92	NO
2000	364 027.85	26 768.02	78 625.09	66 415.31	15 420.75	NO
2010	420 423.25	35 363.43	66 449.58	24 877.77	14 923.01	NO
2011	417 066.68	35 941.64	71 227.26	18 074.69	14 308.51	NO
2012	422 325.51	33 835.62	72 443.02	–6 110.78	12 654.10	NO
2013	414 252.94	32 490.65	72 734.98	–7 660.29	11 847.07	NO
2014	408 582.49	32 399.16	72 801.94	1 023.61	12 008.54	NO
2015	419 575.67	32 327.34	70 011.73	–7 717.65	11 367.98	NO
Per cent change 1990–2015	**42.7**	**24.0**	**–12.7**	**–104.8**	**–42.2**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions; (2) Australia did not report indirect CO_2 emissions in CRF table 6.

Table 10

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for Australia

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				4 700.00				
Technical correction				–4 335.72				
Base year	148 163.36				163.25	6 878.19	103.23	NA
2013		–18 183.33	41 526.58	–21 643.96	–4 277.87	825.90	–100.83	NA
2014		–16 745.32	37 723.97	–23 080.71	–4 724.29	11 815.34	–86.25	NA
2015		–12 613.69	31 137.54	–18 393.56	–4 180.10	8 729.56	–111.94	NA
Per cent change Base year–2015					**–2 660.6**	**26.9**	**–208.4**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] The base year for CM, GM and RV under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Australia. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 11 provides information on the accounting quantities for reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 11

Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol, for Australia

(kt CO_2 eq)

Greenhouse gas source and sink activities	*Base year*[a]	*Net emissions/removals*				*Accounting parameters*	*Accounting quantity*[c]
		2013	*2014*	*2015*	*Total*[b]		
A.1. AR		−18 183.333	−16 745.316	−12 613.695	−47 542.344		−47 542.344
Excluded emissions from natural disturbances[d]		NA	NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA	NA		NA
A.2. Deforestation		41 526.576	37 723.971	31 137.541	110 388.087		110 388.087
B.1. FM		NA	NA	NA	NA		NA
Net emissions/removals		NA	NA	NA	NA		
Excluded emissions from natural disturbances[d]		NA	NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA	NA		NA
Any debits from CEF-ne		NA	NA	NA	NA		NA
FMRL[e]						NA	
Technical corrections to FMRL						NA	
FM cap						NA	
B.2. CM (if elected)	NA	NA	NA	NA	NA		NA
B.3. GM (if elected)	NA	NA	NA	NA	NA		NA
B.4. RV (if elected)	NA	NA	NA	NA	NA		NA
B.5. WDR (if elected)	NA	NA	NA	NA	NA		

[a] Net emissions and removals from CM, GM, RV and/or WDR, if elected, in the Party's base year, as established by decision 9/CP.2.

[b] Cumulative net emissions and removals for all years of the commitment period reported in the current submission.

[c] The accounting quantity is the total quantity of units to be issued or cancelled for a particular activity.

[d] The Party has indicated it does not intend to exclude emissions from natural disturbances for the accounting of AR. The Party has indicated it is excluding emissions from natural disturbances for the accounting of FM at the end of the commitment period

[e] FM reference level as inscribed in the appendix of the annex to decision 2/CMP.7, in kt CO_2 eq per year.

3. Table 12 provides an overview of relevant key data for Australia's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 12
Key relevant data for Australia under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: annual accounting (b) Deforestation: annual accounting (c) FM: commitment period accounting (d) CM: commitment period accounting (e) GM: commitment period accounting (f) RV: commitment period accounting (g) WDR: not elected
Election of activities under Article 3, paragraph 4	CM, GM and RV
Election of application of provisions for natural disturbances	Yes, for FM
3.5% of total base-year GHG emissions, excluding LULUCF	14 651.806 kt CO_2 eq (117 214.453 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015[a]	Issue 30 273 852 RMUs
2. Deforestation in 2015[a]	Cancel 36 124 729 units
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

[a] The quantities issued and cancelled under each activity under Article 3, paragraph 3, and paragraph 4, if relevant, are based on the final accounting quantity as contained in table 11 above, and correction for any units issued and/or cancelled in the 2016 final annual review report taking in consideration recalculations between the 2016 and the 2017 submissions.

Annex II

Information to be included in the compilation and accounting database

Tables 13–15 include the information to be included in the compilation and accounting database for Australia. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 13
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for Australia
($t CO_2 eq$)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	4 060 457 844			4 060 457 844
Annex A emissions for 2015				
CO_2	402 159 570			402 159 570
CH_4	100 895 025			100 895 025
N_2O	18 442 603			18 442 603
HFCs	11 482 742			11 482 742
PFCs	171 324			171 324
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	131 449			131 449
NF_3	NO			NO
Total Annex A sources	**533 282 713**			**533 282 713**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	–12 613 695			–12 613 695
3.3 Deforestation	31 137 541			31 137 541
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	–18 393 558			–18 393 558
3.4 CM	–4 180 099			–4 180 099
3.4 CM for the base year	163 247			163 247
3.4 GM	8 729 558			8 729 558
3.4 GM for the base year	6 878 186			6 878 186
3.4 RV	–111 941			–111 941
3.4 RV in the base year	103 234			103 234

Table 14
Information to be included in the compilation and accounting database for 2014, for Australia
($t CO_2$ eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2	393 572 069			393 572 069
CH_4	100 911 251			100 911 251
N_2O	20 199 321			20 199 321
HFCs	10 787 351			10 787 351
PFCs	192 536			192 536
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	129 605			129 605
NF_3	NO			NO
Total Annex A sources	**525 792 133**			**525 792 133**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	−16 745 316			−16 745 316
3.3 Deforestation	37 723 971			37 723 971
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	−23 080 705			−23 080 705
3.4 CM	−4 724 287			−4 724 287
3.4 CM for the base year	163 247			163 247
3.4 GM	11 815 345			11 815 345
3.4 GM for the base year	6 878 186			6 878 186
3.4 RV	−86 254			−86 254
3.4 RV in the base year	103 234			103 234

Table 15
Information to be included in the compilation and accounting database for 2013, for Australia
($t CO_2$ eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2	398 292 629			398 292 629
CH_4	102 870 343			102 870 343
N_2O	19 807 585			19 807 585
HFCs	10 034 128			10 034 128
PFCs	192 001			192 001
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	128 945			128 945
NF_3	NO			NO
Total Annex A sources	**531 325 630**			**531 325 630**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	−18 183 333			−18 183 333
3.3 Deforestation	41 526 576			41 526 576
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	−21 643 958			−21 643 958
3.4 CM	−4 277 866			−4 277 866
3.4 CM for the base year	163 247			163 247
3.4 GM	825 903			825 903
3.4 GM for the base year	6 878 186			6 878 186
3.4 RV	−100 828			−100 828
3.4 RV in the base year	103 234			103 234

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) Category 4.A.2 Land converted to forest land (see ID# L.7 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

IPCC reports

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2013, 2014, 2015 and 2016 annual submission of Australia, respectively, contained in documents FCCC/ARR/2013/AUS, FCCC/ARR/2014/AUS, FCCC/ARR/2015/AUS and FCCC/ARR/2015/AUS.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Amlinger F, Peyr S and Cuhls C. 2008. Greenhouse gas emissions from composting and mechanical biological treatment. *Waste Management and Research*. 26(1): pp.47–60.

Annual status report for Australia for 2017. Available at http://unfccc.int/resource/docs/2017/asr/aus.pdf.

Charmley E, Williams SRO, Moate PJ, et al. 2015. A universal equation to predict methane production of forage-fed cattle in Australia. *Animal Production Science*. 56(3): pp.169–180.

Gifford R. 2000a. *Carbon Content of Woody Roots. Revised Analysis and a Comparison with Woody Shoot Components (Revision 1)*. National Carbon Accounting System Technical Report No. 7. Canberra: Australian Greenhouse Office.

National Greenhouse Gas Inventory Committee. 1995. *The Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks. Workbook for Landfill, Wastewater and Other Waste Activities. National Greenhouse Gas Inventory Committee Workbook 8.0*. Canberra: Deparment of Climate Change.

Wiedemann S, Sullivan T and McGahan EJ. 2014. *GHG Prediction Methods for Feedlots, Poultry and Pigs*. Technical Report for the Department of Environment Greenhouse Gas Inventory Team. FSA Consulting Report 8199/1. Canberry: Department of the Environment.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Robert Sturgiss (Climate Change and Renewable Energy Division, Department of the Environment), including additional material on the methodology and assumptions used.